(12) UK Patent Application (19) GB (11) 2 154 496 A

(43) Application published 11 Sep 1985

(21) Application No 8505013

(22) Date of filing 27 Feb 1985

(30) Priority data

(31) 8405044 (32) 27 Feb 1984 (33) GB

(51) INT CL[4]
B26B 21/56 21/14

(52) Domestic classification
B4B 33B2 33D1 34F

(56) Documents cited
GB 1259251 GB 1119767
GB 1136449

(58) Field of search
B4B

(71) Applicant
The Gillette Company (USA-Delaware),
Prudential Tower Building, Boston, Massachusetts 02199,
United States of America

(72) Inventor
John Frederick Francis

(74) Agent and/or Address for Service
A. A. Thornton & Co.,
Northumberland House, 303-306 High Holborn,
London WC1V 7LE

(54) Safety razors

(57) In a safety razor having cutting edges directed towards each other across a gap, i.e. an opposed blade razor, the blade edges are each formed with undulating edges. The blade margins are preferably corrugated and the corrugations intersected by planar facets (12), the facets of the two blades being substantially in the same plane (T).

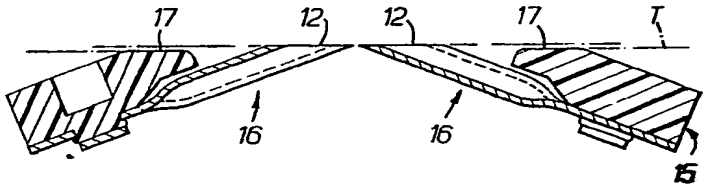

FIG. 6.

GB 2 154 496 A

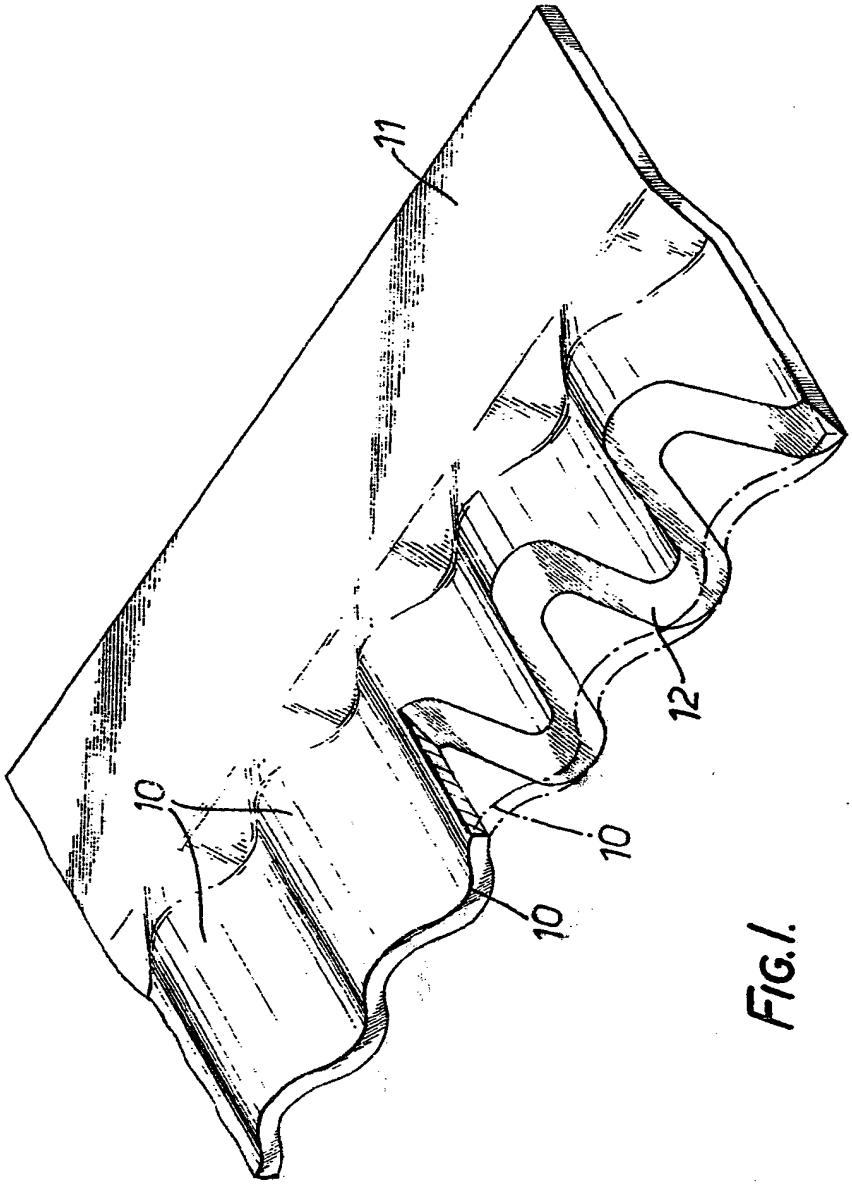

FIG. 1.

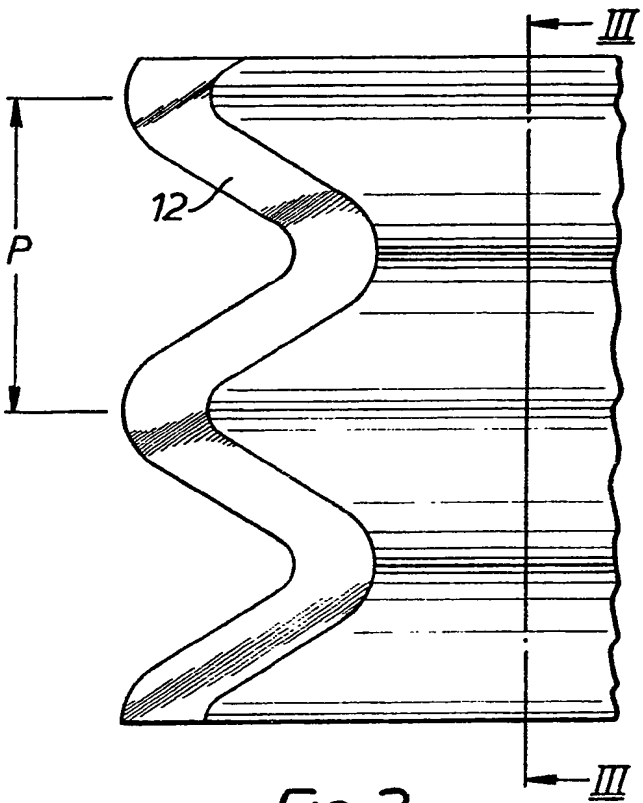

FIG. 2.

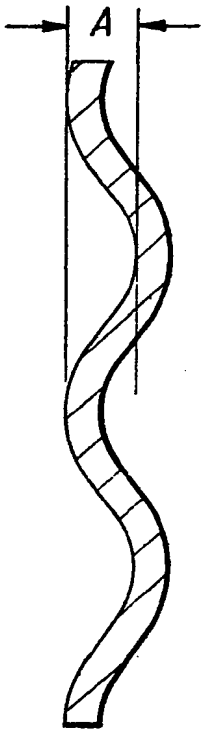

FIG. 3.

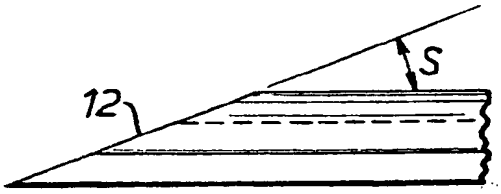

FIG. 4.

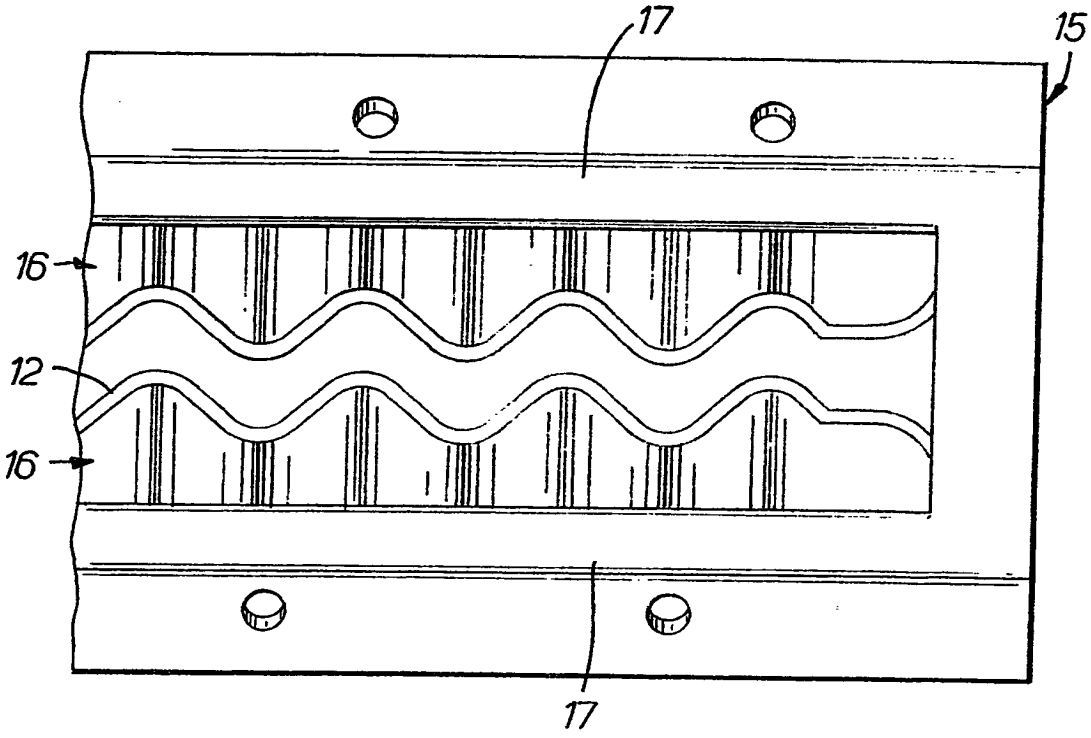

FIG. 5.

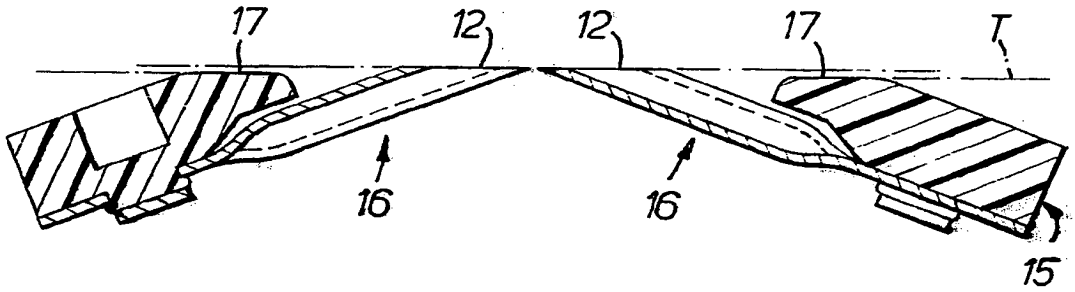

FIG. 6.

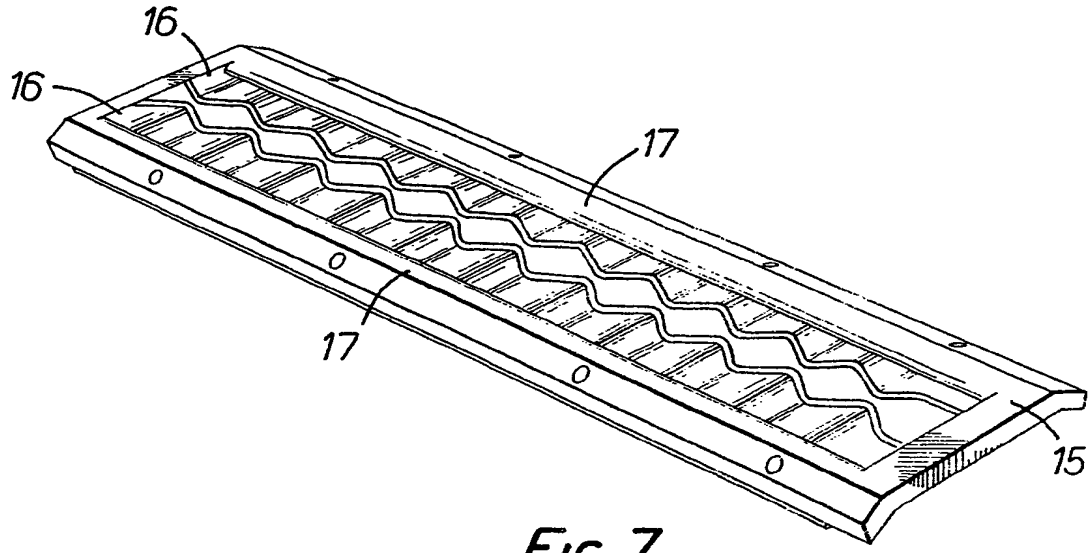

FIG. 7.

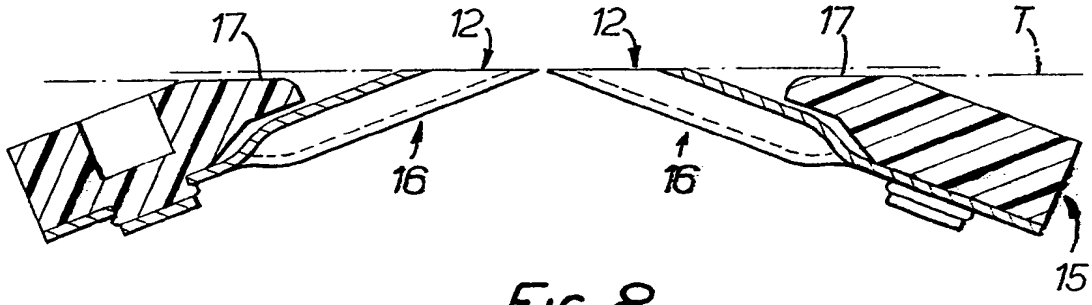

FIG. 8.

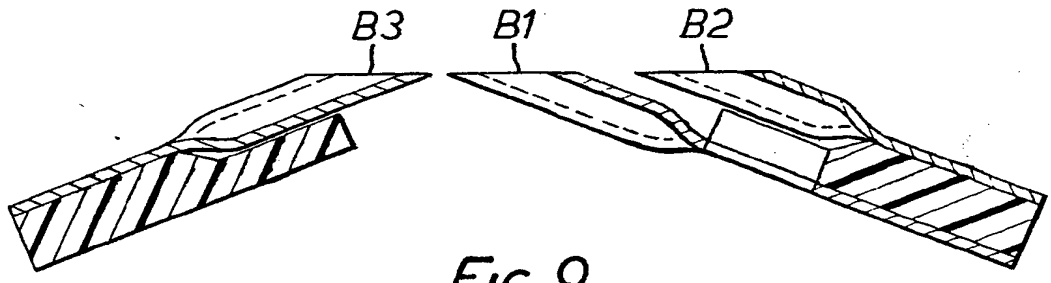

FIG. 9.

SPECIFICATION

Safety razors

This invention relates to safety razors of the known form comprising a pair of opposed blade members having respective cutting edges directed towards each other across a gap.

Razors of this general form are known, for example, from British Patent Specification 1119767 and 1136449, and are used by moving the razor to and fro over the skin in a direction generally perpendicular to the lengths of the cutting edges. Such razors are hereinafter referred to for convenience as "opposed blade razors".

In accordance with a feature of the present invention, the blades of such a razor are each formed with undulating sharpened edges.

In a presently preferred form of the invention, each of the blades has a marginal portion formed with corrugations extending transversely to the edge of the blade and a substantially planar facet intersecting the corrugations over the full depth thereof to define the undulating sharpened edge.

The blade facets are set substantially parallel with each other and, in use of the razor substantially parallel with the skin surface being shaved.

With this arrangement it is found that the razor offers a high degree of safety to the user since each of the blades effectively guards the skin against any tendency for the peaks of the other blade to dig into the skin, and it is found unnecessary in some cases to provide additional cap or guard portions of the razor. At the same time, a high degree of shaving efficiency is achieved, mainly due to the ability of the blades to pick up and sever facial hairs growing in various directions out of the skin. Individual hairs tend to be sliced by the obliquely extending portions of the blade edges.

Some embodiments of the invention will now be described in detail, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a scrap perspective view of the edge of a blade incorporated in razors of the present invention;

Figure 2 is a plan view of the blade edge shown in Figure 1;

Figure 3 is a section on the line III-III of Figure 2;

Figure 4 is an end view of the blade edge form of Figures 1 to 3;

Figure 5 is a scrap plan view of a razor in accordance with the invention, incorporating blades as shown in Figures 1 to 4;

Figure 6 is a cross-section of the head of the razor seen in Figure 5;

Figures 7 and *8* are a perspective view and cross-section, respectively, of a modified razor head or cartridge; and

Figure 9 is a cross-section of another form of razor head in accordance with the invention.

The blade edge shown in the drawings is produced by forming a series or corrugations 10 in the marginal portion of a planar blade strip 11. The corrugations extend perpendicular to the edge of the strip and preferably extend equally to opposite sides of the plane of the blade strip 11.

The blade strip is then hardened and then ground by a conventional grinding wheel to form a facet 12 which may be perfectly plane, or it may be formed by the periphery of a grinding wheel, in which case it will be slightly concave, although for practical purposes it may be regarded as substantially planar.

The facet intersects the series of corrugations over the full depth thereof, so as to define an undulating sharpened edge which is co-planar with the facet 12 but which follows the contours of the corrugations.

The edge may be finished by conventional means, for example by electropolishing, to remove grinding burrs and to polish the facet 12.

In grinding the facet, it is presently preferred to grind away from the edge, i.e. with the periphery of the grinding wheel passing downwardly along the facet 12 as viewed in Figure 4. This technique has less tendency to damage the sharpened edge. It results in a feathery burr, but this is found to be readily removed by electropolishing.

A wide variety of edge shapes may be derived by variations in the corrugations, particularly with reference to their pitch, amplitude and form. The amplitude ('A' in Figure 3) may, for example, be 0.15, 0.25 or 0.38 mm and their pitch ('P' in Figure 2) may be in the order of 0.5 to 2.0 mm.

The corrugations may conveniently be formed by a conventional press-tool, and the same tool may be employed to produce corrugations of different amplitudes by varying the degree of closure of the die and punch.

The corrugations shown are of generally sinusoidal form but they might alternatively be more angular, e.g. of generally V-shape.

The angle ('S' in Figure 4) between the facet 12 and the plane of the strip may be in the range of 18° to 30°, and preferably between 18° and 25°. The angle 'S' illustrated is $22\frac{1}{2}°$.

In the opposed blade razor shown in Figures 5 and 6, the head of the razor comprises a moulded support 15 having the general form of an open rectangular frame. Two single edged blades 16 are secured to the underside of the support, the blades each having an undulating cutting edge formed, as described above, by corrugations 10 and substantially planar facets 12.

The undulating edges are directed towards each other with the peaks of one edge in register with the troughs of the opposite edge, across a gap of 1.25 mm, which is uniform along the lengths of the blade edges.

The upper surfaces 17 of the longitudinal sides of the support form skin engaging surfaces set in a common, notional tangent plane 'T'.

The blade facets 12 are set parallel to each other and to the tangent plane 'T', and are set above the plane 'T' by a distance of .05 mm.

It will be noted that the gap of 1.25 mm between the blade edges is considerably larger than would normally be acceptable for opposed edge razors having conventional, rectilinear edges, which

would usually be not greater than about 0.75 mm.

In the modified razor head shown in Figures 7 and 8, the only significant difference is that the two blades are positioned to have the peaks of the respective cutting edges directly opposite each other. This results in the gap between the blade edges being much larger across the troughs in the edges, but does not significantly increase the risk of the skin bulging unduly into those portions of the gaps since the skin is supported by the inclined flanks of the edges.

In the above described embodiment the two blade edges are identically formed, but it would of course be possible to employ two blades whose edge forms differ for example with respect to the pitch and/or depth of their corrugations.

Although the illustrated razors have skin engaging portions 17, these are not strictly necessary to protect the user against the blade edges digging into the skin but mainly serve to assist the user in maintaining a proper orientation of the razor head relative to the skin.

The above described heads may be formed as disposable cartridges for removable mounting on razor handles, either of elongate grip form or of blade form, or may be permanently united with the handles to form disposable razors.

In another form of razor in accordance with the invention, illustrated in Figure 9, the razor head takes the general form of a tandem blade head or cartridge incorporating two blades B1, B2 arranged with their cutting edges spaced apart to act in tandem upon the skin. However, the blades B1, B2 are both of the form described above, with the undulations of their respective blade edges in register with each other. Furthermore, the usual guard member of a conventional razor head is replaced by a third blade B3, of the same edge form as blades B1 and B2, having its cutting edge directed towards that of the leading blade B1 of the tandem pair, and its undulations opposite the troughs of the blade B1, i.e. so that a constant gap is left between the confronting edges.

This razor may be used conventionally, to shave with the tandem edges of blades B1 and B2, but may also be used, with a to and fro scrubbing action, with the blade B3 active in the reverse stroke, while the blades B1 and B2 act as skin guards.

Neither the guard nor the cap of a conventional razor are required, thanks to the substantial width of skin engaging facets of the array of blades.

CLAIMS

1. An opposed blade razor (as herein defined), wherein the opposed blades are each formed with undulating sharpened edges so as to have alternating peaks and troughs.

2. A razor according to claim 1, wherein the blade edges of the two blades are substantially identically formed, and the peaks of one blade edge are in registry with the valleys of the other.

3. A razor according to claim 1, wherein the blade edges of the two blades are substantially identically formed, and the peaks of the respective blade edges are in registry with each other.

4. A razor according to claim 1, 2 or 3, wherein each of the blades has a marginal portion formed with corrugations extending transversely to the edge of the blade and a substantially planar facet intersecting the corrugations over the full depth thereof to define the said undulating cutting edge.

5. A razor according to claim 4, wherein the facets of the respective blade edges are set substantially co-planar with each other.

6. A razor according to any preceding claim, wherein in a third of corresponding edge form is set behind one of the opposed blades to form with that one blade a tandem blade pair.

7. An opposed blade razor, substantially as herein described with reference to Figures 5 and 6, or Figures 7 and 8 and Figure 9 of the accompanying drawings.

Printed in the UK for HMSO, D8818935, 7/85, 7102.
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.